

ABSTRACT

An object of the present invention is to provide at low cost, a highly functional and small size optical amplifier, which realizes a polarization mode dispersion (PMD) compensation function and an optical amplifying function, with a simple construction. To this end, the optical amplifier of the present invention comprises: a polarization control section that controls the polarization state of input signal light; a PMD generation section that receives the signal light from the polarization control section at a polarization-preserving fiber thereof doped with a rare earth element, and gives a differential group delay between orthogonal polarization mode components of the signal light to perform PMD compensation and at the same time amplifies the signal light; a pumping light supply section that supplies pumping light to the polarization-preserving fiber; a monitoring section that monitors the PMD generation state of the signal light from the PMD generation section, and the like; and a control section that controls the polarization control section and the pumping light supply section based on the monitor results of the monitoring section.